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DOI:

[10.16910/jemr.11.5](https://doi.org/10.16910/jemr.11.5)

2018

Document Version:

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Nyström, M., Niehorster, D. C., Andersson, R., & Hooge, I. (2018). *Is the Tobii Pro Spectrum a useful tool for microsaccade researchers?*. Abstract from The Scandinavian Workshop on Applied Eye Tracking 2018, Copenhagen, Denmark. <https://doi.org/10.16910/jemr.11.5>

Total number of authors:

4

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SESSION 1: Eye-tracking technology: Latest developments

Is the Tobii Pro Spectrum a useful tool for microsaccade researchers?

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Throughout the history of eye movement research, the exact properties of microsaccades have been debated (Collewyn & Kowler, 2008). Part of the reason is differences in instrumentation (Nyström et al., 2016). Therefore, the introduction of a new eye tracker to record fixational eye movements should always be followed by careful investigation of its data quality and a comparison against currently used and established tools.

We recorded eye movements from four people with a newly introduced stereo camera eye tracker (Tobii Pro Spectrum, 600 Hz and 1200 Hz) and the standard eye tracker in the field (EyeLink 1000 Plus, filtered and unfiltered) during a fixation task. Microsaccades were clearly visible in both systems, and comparable microsaccade rates and amplitudes were found when applying a standard algorithm for microsaccade detection (Engbert & Kliegl, 2003). Precision, defined as the root mean square (RMS) of intersample distances, was similar across the systems in the horizontal direction. However, vertical RMS was a factor two lower in the data recorded with the EyeLink compared with the Tobii Pro Spectrum, indicating higher precision.

We conclude that the Tobii Pro Spectrum is a useful tool for microsaccade researchers.

References

- Collewyn, H., & Kowler, E. (2008). The significance of microsaccades for vision and oculomotor control. *Journal of Vision*, 8(14), 20.1-20.21. doi: 10.1167/8.14.20
- Engbert, R., & Kliegl, R. (2003). Microsaccades uncover the orientation of covert attention. *Vision Research*, 43(9), 1035-1045.
- Nyström, M., Hansen, D. W., Andersson, R., & Hooge, I. (2016). Why have microsaccades become larger? Investigating eye deformations and detection algorithms. *Vision Research*, 118, 17-24. doi: 10.1016/j.visres.2014.11.007